



Chapter 7. Cultural Resources

7.1 Overview

This chapter discusses the prehistoric and historic setting of the ARC facility and describes the archaeological and historic resources that remain on the site. This chapter also includes a discussion of the regulatory framework applicable to cultural resources and relevant plans, policies, guidelines, and measures that govern historic and archaeological resources at ARC. The information presented in this chapter is based on the November 2009 NASA ARC ERD (NASA 2009), NADP EIS (Design, Community & Environment 2002), historical survey reports, and other sources.

7.2 Regulatory Background

7.2.1 Federal Regulations

7.2.1.1 *Section 106 of the National Historic Preservation Act of 1966*

Section 106 of the NHPA, as amended (16 USC 470) and 36 CFR 800) require that projects receiving federal money, or those permitted or licensed by federal agencies, must take into account the effects of the undertaking on historic properties, consult with the State Historic Preservation Officer (SHPO) regarding those effects, and allow the Advisory Council on Historic Preservation an opportunity to comment on the undertaking. Regulations implementing Section 106 encourage that consultation be completed in parallel with the NEPA compliance process.

Section 106 defines a *historic property* or *historic resource* as “any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion” on the National Register of Historic Places (NRHP).

7.2.1.2 *Archaeological Resources Protection Act of 1979*

The Archaeological Resources Protection Act of 1979 (ARPA) (16 USC 470; 43 CFR 7) requires federal land-owning agencies to issue ARPA permits to qualified individuals, institutions, or firms that conduct archaeological surveys within federal and Native American lands.

7.2.1.3 *Native American Graves and Protection and Repatriation Act of 1990*

The Native American Graves and Protection and Repatriation Act of 1990 (NAGPRA) (Title 25, USC, Section 3001 et seq.) requires federal agencies and federally funded projects to document Native American human remains and cultural items within their collections, notify Native American groups of these items, and provide an opportunity for repatriation of these materials. It also requires plans for dealing with potential future collections of Native American human remains and associated funerary objects, sacred objects, and objects of cultural patrimony discovered as a result of projects funded or overseen by the federal government.



7.2.1.4 National Environmental Policy Act

NEPA requires federal agencies to include in their decision-making process appropriate and careful consideration of all environmental effects of a proposed action and of possible alternative actions. Measures to avoid or minimize the adverse effects of proposed actions and to restore and enhance environmental quality as much as possible must be developed and discussed where feasible.

7.3 Regional Prehistoric and Historic Setting

7.3.1 Prehistoric Setting

Archaeological research suggests that the southern shore of the San Francisco Bay has been inhabited continuously for up to 4,000 years. At the time of European contact, the Costanoans (from the Spanish Costanos or “coastal people”), a group of hunting and gathering communities indigenous to central California inhabited the Santa Clara Valley. Linguistic analysis suggests that the Costanoans arrived in the San Francisco Bay region around A.D. 500. The term Costanoan as applied by anthropologists does not imply the existence of a politically unified entity, but rather refers to different groups of people who shared similar cultural traits and belonged to the same linguistic family. Descendants of the group that currently reside in the San Francisco Bay Area generally prefer the term “Ohlone.”

ARC lies within the Tamyen (Tamien) and Ramaytush areas of the Ohlone geographic range. Based on Spanish mission records and archaeological data, researchers have estimated a 1770 population of 1,000 to 1,200 individuals for this area. Within the Tamyen and Ramaytush areas, the population was further subdivided into tribelets. It is believed that the Posol-mi tribelet occupied the area comprising present-day ARC.

The place name Posol-mi is probably derived from Rancho Posolmi, the grant confirmed to Native American Lopez Indigo (alternatively Ynigo) in 1881. Ynigo occupied the land east of the City of Mountain View as early as 1834. Lopez Indigo and other Native Americans are known to have farmed the ARC property from at least 1834 through 1864.

Historic accounts from the 1770s to 1790s and archaeological data suggest that a number of tribelets may have had temporary camps within the vicinity of ARC. However, the Ohlone way of life seems to have disappeared by 1810 due to introduced diseases, declining birth rates, and the impact of the mission system. The Ohlone people transformed from hunters and gatherers into agricultural laborers (and in some cases, craft artisans). They lived at the missions and worked with former neighboring groups.

Although the area around ARC continued to be settled in the early part of the 19th century, the patterns of use changed. The economy began to focus on the growth of agricultural crops and the transportation of those crops to market through a series of landings and associated warehouses along the San Francisco Bay. The Native Americans from Mission Santa Clara were apparently involved in the hide and tallow trade that coursed up and down the Guadalupe River between 1820 and 1850. Individuals from the mission carried the products down to the embarcadero where they could be loaded onto ships. Later,



because of the secularization of the missions by Mexico in 1834, most of the aboriginal population gradually moved to ranchos to work as manual laborers.

7.3.2 Historic Setting

Spanish explorers in the late 1760s and 1770s were the first Europeans to traverse the Santa Clara Valley. The first party, that of Gaspar de Portola and Father Juan Crespi, arrived in the Alviso-San Jose area in the fall of 1769. Sergeant Jose Francisco Ortega of the Portola and Crespi party was sent to explore the eastern portion of the San Francisco Bay. The second Hispanic exploration party, that of Juan Bautista de Anza and Father Pedro Font, reached the lower Guadalupe River in early 1776. The favorable reports of Anza and Font led to the establishment of both Mission Santa Clara and the Pueblo San Jose de Guadalupe in 1777.

The Mexican revolt against Spain (1822) followed by the secularization of the missions (1834) significantly changed land ownership patterns in the Santa Clara Valley. Whereas the Spanish philosophy of government was directed toward the founding of presidios, missions, and secular towns, the Mexican policy stressed individual ownership of the land. During the Mexican Period, vast tracts of land, including former mission lands, were granted to individuals.

After 1875, horticulture became widespread due to successful crop experimentation and the expansion of markets via rail. The shift from livestock to horticulture permitted smaller parcels of land and generated a labor-intensive but profitable product. In the 1880s, after the development of the refrigerator railroad car, horticulture became Santa Clara Valley's primary land use. Throughout this period, Santa Clara Valley's population increased substantially.

During the first half of the 20th century, the Cities of Mountain View, Sunnyvale, Milpitas, and San Jose were isolated central services centers surrounded by farmsteads and acres of agricultural lands. This predominance of fruit production/processing held steady until after World War II. In the second half of the century, dense urban housing, commercial centers, and the electronics industry displaced Santa Clara Valley's agrarian land use.

7.4 Existing Site Conditions

7.4.1 Archaeological Resources

A portion of ARC is situated on the west part of Rancho Posolmi (see discussion above). Several adobe dwellings were located in the ARC area, but they were destroyed long ago. According to previous historic documents, no structures were located at ARC during most of the second half of the 18th century.

According to a review of existing data, several recorded prehistoric archaeological resources are located throughout the ARC site. Most subsurface resources are on the southeast side of the site. These resources are associated with prehistoric dwellings ranging from small temporary encampments to large villages such as that identified as Posol-mi.



One recorded resource, CA-SC1-23, was located in a previously cultivated field on the western portion of ARC known as the Kitchen Midden Site. It was recorded in the early part of the 20th century and was supposedly still extant in the mid-1950s. Investigations conducted for NASA in the 1970s and 1980s, however, did not result in the location of this site. Therefore, in 1991, Basin Research Associates conducted a detailed surface survey and mechanically assisted subsurface testing program. Fifty-eight backhoe test units were excavated in a grid-like pattern in the project area. No artifacts associated with past site occupation were detected at or below the surface. Destruction by agricultural practices (that is, dispersion) is a likely cause of the site's disappearance. The findings of Basin Research Associates were submitted to the SHPO, who concurred with the determination that the CA-SC1-23 site is no longer extant.

Although 10 other prehistoric or prehistoric/historic archaeological sites have been previously recorded within the boundaries of ARC (four are associated with Ynigo), these sites no longer exist.

In summary, no known, extant archeological resources at ARC qualify for inclusion on the NRHP. The integrity of all archaeological resources was apparently destroyed by past agricultural practices (for example, disking and tilling) or construction of the airfield.

7.4.2 Historic Resources

7.4.2.1 Shenandoah Plaza Historic District

On February 24, 1994, the Shenandoah Plaza Historic District was officially added to the NRHP. The buildings, landscapes, and objects included in the district are listed on the NRHP because of their association with the expanding coastal defense capabilities of the U.S. Navy and airship technology during the inter-war period between 1932 and 1945, and because of their distinctive site plan and Spanish Colonial Revival architecture.

The District consists of 97 buildings, structures, and objects, 58 of which contribute to its historic significance. The District's significant buildings, structures, and objects that are under NASA's jurisdiction are listed in Table 7-1. The rest are within Wescoat Village military housing area and are under the stewardship of the DOD. Non-contributing buildings within Shenandoah Plaza that are under NASA's stewardship are listed in Table 7-2.

The "contributing" buildings and structures are representative of the development of the NAS Sunnyvale from the early 1930s through the early 1960s (NAS Sunnyvale was renamed NAS Moffett Field in 1942). Among the buildings in the Shenandoah Plaza Historic District, the Spanish Colonial Revival style dominates, with its neutral colors, red tile roofs, terracotta ornamentation, and almost residential proportions. Buildings are typically two stories tall, with low-pitched, slightly hipped rooflines. Exterior walls are consistently quite plain, except for a stringcourse around the entire perimeter of each building separating the first and second floors. Windows are simple rectangular shapes, vertically oriented, multi-paned, and double-hung. Flowery terracotta ornamentation defines the major front and back entrances, and often some of the most prominent windows.



The 1933 site plan, created by the Navy Department Bureau of Yards and Docks, is based on an axial layout with major administrative buildings set symmetrically along a generous 1.5-hectare (4.5-acre), horseshoe-shaped central greensward. The formal lawn sweeps eastward to the immense streamlined form of Hangar 1, which provides a majestic focal point for the Shenandoah Plaza Historic District and for ARC as a whole. In addition, the original site plan's broad expanses of lawn and rows of mature liquid amber trees have been preserved, and give the Shenandoah Plaza Historic District a formal, park-like feel quite distinct from the surrounding landscape of the Baylands.

Table 7-1. Contributing Buildings, Structures, and Objects within the Shenandoah Plaza Historic District (NASA Stewardship Only)

Bldg. No.	Current Identification	Historic Use	Date Built
1	Hangar 1	Hangar 1	1933
2	Gymnasium	Balloon Hangar	1933
5	Water Storage Tower	Water Tower	1933
10	Boiler Plant Facility Shop	Heat Plant	1933
15	NASA Security, Employee Badging Office	Fire Station/Laundry	1933
16	Maintenance Shops & Offices	Locomotive Crane Shed	1933
17	Naval Air Reserves, Santa Clara HQ	Admirals Building	1933
18	Army Explosive Ordnance Department	Aerological Center	1933
19	NASA Research Support	Bachelor Enlisted Quarters	1933
20	Bachelor Officers Quarters	Bachelor Officers Quarters	1933
21	Bachelor Officers Quarters Detached Garage	Bachelor Officers Quarters Garage	1933
22	Bachelor Officers Quarters Detached Garage	Bachelor Officers Quarters Garage	1933
23	Army Reserve Center	Dispensary	1933
24	Offices	Ambulance Garage	1933
25	Theater, Army Reserves Center	Bowling Alley/Theater	1933
26	Visitor Badging Office	Gate House/Iron Fence	1933
32	North Floodlight Tower	Floodlight Tower	1933
33	South Floodlight Tower	Floodlight Tower	1933
37	Scale House	Scale House	1933
46	Hangar 2	Hangar 2	1943
47	Hangar 3	Hangar 3	1943
55	Boiler House for Hangars 2 and 3	Heat Plant for Hangars 2 and 3	1943
N/A (40)	Flagstaff	Flagpole	1933
N/A	Commons	Commons	1933
N/A (17A)	Memorial Anchor	Anchor	pre-1950
69	Inert Ammunition Storage	Inert Storehouse - Bulk	1943



Bldg. No.	Current Identification	Historic Use	Date Built
70	Fuse and Detonator Magazine	Fuse and Detonator Magazine – Ready Issue	1943
71	High Explosive Magazine	Explosive Storage (Miscellaneous)	1943
72	High Explosive Magazine	Explosive Storage (Miscellaneous)	1943
73	High Explosive Magazine	Explosive Storage (Miscellaneous)	1943
74	High Explosive Magazine	Explosive Storage (Miscellaneous)	1943
105	Airfield Lighting Vault	Substation	1947
106	Aircraft Compass Calibration Pad, Compass Rose	Compass Calibration Pad, Surfaced	1947
141	Tank Truck Filling Rack	Aircraft Truck Fueling Facility	1952
143	High Explosive Magazine	Explosive Storage (Miscellaneous)	1951
147	High Explosive Magazine	Explosive Storage (Miscellaneous)	1951
158	Flight Operations Building and Tower	Flight operations	1954
329	Ultra High Frequency/Very High Frequency Receiver Building	Facilitate air traffic control communications	1958
442	Ordnance Handling Pad	Taxiway (Concrete)	1956
454	Ultra High Frequency/Very High Frequency Transmission Building	Communications Building.	1960
MF 1016	West Parallel Aircraft Taxiway	Taxiway (Concrete)	1945
MF 1016	East Parallel Aircraft Taxiway	Taxiway (Concrete)	1945
MF 1016	Connecting Taxiways	Taxiway (Concrete)	1945
MF1000	Runway 32l/14r	Taxiway (Concrete)	1944
MF1001	Instrument Runway 32r/14l	Taxiway (Concrete)	1945
MF1002	Aircraft Parking Apron	Aircraft Parking, Access or Maintenance Apron (Concrete)	1945
MF1003	High-Speed Aircraft Fueling Pits	Aircraft Direct Fueling Station	1955
N200 Administration Building	Administration Building	Center Administration	1943
N221	40 x 80-Foot Wind Tunnel	Aerodynamic testing	1944



Bldg. No.	Current Identification	Historic Use	Date Built
N226	6 x 6-Foot Supersonic Wind Tunnel	Aerodynamic testing	1946
N227	Unitary Plan Wind Tunnel	Aerodynamic testing	1955
N227A	11-Foot Transonic Wind Tunnel	Aerodynamic testing	1955
N227B	9 x 7-Foot Supersonic Wind Tunnel	Aerodynamic testing	1955
N227C	8 x 7-Foot Supersonic Wind Tunnel	Aerodynamic testing	1955
N227D	Unitary Plan Wind Tunnel Electrical Auxiliary Building and Substation	Substation	1955
N238	Arc Jet Laboratory	Thermal testing	1964
N243	Flight and Guidance Simulation Laboratory	Flight simulation	1967
Source: NASA 2009 and AECOM 2014.			

Table 7-2. Non-Contributing Buildings within the Shenandoah Plaza Historic District (NASA Stewardship Only)

Bldg. No.	Current Identification	Date Built	Reason for Ineligibility
3	Moffett Conference/Banquet Center	1933	Loss of integrity
6	Public Works/Recycling, Storage	1933	Loss of integrity
12	Commissary	1933	Loss of integrity
13	Commissary Storage	1933	Loss of integrity
14	Moffett Field Police	1933	Loss of integrity
29	Office Equipment/Repair	1932	Loss of integrity
31	Commissary/Storage	1933	Loss of integrity
34	Photo Shop	1934	Unremarkable
36	Sentry House, Main Gate	1934	Loss of integrity
44	Storage Facility	1942	Unremarkable
45	NAR Hazardous Materials Building	1944	Unremarkable
64	Storage, Shop	1940	Unremarkable
67	Post Office	1943	Unremarkable
76	Lock Smith	1944	Loss of integrity
79	Battery, Supply Storehouse	1944	Unremarkable
81	Maintenance Storage	1944	Unremarkable
85	Metalizing, Sandblasting Shop	1944	Unremarkable
93	Aircraft Shop	1946	Unremarkable
115	Storage, Decontamination	1943	Unremarkable
117	Storage	1944	Unremarkable
126	Warehouse	1949	Unremarkable
133	Hazardous, Flammable Storage	1950	Unremarkable
175	Line Maintenance Shelter	1956	Unremarkable
346	Aircraft Line Operations Building	1950	Unremarkable
350	Line Maintenance Shelter	1950	Unremarkable
367	Storage	1948	Unremarkable
460	Storage	1950	Unremarkable
470	Storage	1933	Unremarkable
472	Airframes Shop		Unremarkable



Bldg. No.	Current Identification	Date Built	Reason for Ineligibility
478	Standby Generator	1963	<50 Years Old
482	Painting & Washing Facility	1963	<50 Years Old
493	Swimming Pool, Officer Area	1963	<50 Years Old
498	Covered HazMat Storage Area	1965	<50 Years Old
499	Ground Support Equipment Shed	1966	<50 Years Old
501	Fire Station, AIB	1940	Loss of integrity
509	Exchange Shop	1968	<50 Years Old
510	NASA Maintenance Office	1967	<50 Years Old
527	Storage Shed	1968	<50 Years Old
539	Flight Line Storage	1972	<50 Years Old
540	Flight Line Storage	1972	<50 Years Old
542	Incinerator	1973	<50 Years Old
566	Plant Engineering Support Office	1979	<50 Years Old
567	Warehouse	1978	<50 Years Old
569	Air Force, Special Investigations	1978	<50 Years Old
570	Maintenance Storage	1978	<50 Years Old
941	Administration Office, Navy Exchange	1940	Loss of integrity
942	Navy Exchange, Crafts	1940	Loss of integrity

Source: NASA 2009.

Of the historic buildings within the Shenandoah Plaza Historic District, the most striking are the Administration Building (Building 17), which sits at the head of Shenandoah Plaza, the Bachelor Officers Quarters (Building 20), and the original hangars, especially Hangar 1.

The almost 1,800-square meter (19,000 square foot) Administration Building, constructed in 1933, follows the typical architectural pattern of the original campus design: two stories high with stucco walls, red tile roofing, and terracotta ornamentation. It is the most prominently sited building within the original 1933 campus plan. Unlike the other buildings in the Shenandoah Plaza Historic District, the Administration Building's primary entrance projects out from the main structure, with a triple round-arched entrance. The detailing around the major entrances and windows includes ornamental urns, pilasters, and floral sculpture that counterpoint the austere, shallow cruciform shape of the building. There is also a small, centered bell tower with flat arches on each of its faces, capped by a small red dome.

The Bachelor Officers Quarters (Building 20), constructed in 1933, is also a large two-story structure in the typical Spanish Colonial style of the Shenandoah Plaza Historic District buildings. It sits on the south side of the plaza where the central green widens outwards, facing the equally prominent but less architecturally impressive Bachelor Enlisted Quarters. The Bachelor Officers Quarters has more ornamentation than other buildings in the Shenandoah Plaza Historic District, and a very elegant entryway of three large round arches. A rear wing projects south from the building and abuts the original 1933 officer automobile storage structures, Buildings 22, and 21.

The most significant building in the Shenandoah Plaza Historic District, however, is Hangar 1, which was designed in the Streamline Moderne style to emulate the sleek, ultra-modern form of the airship it was built to house rather than the Spanish Colonial Revival



architecture of the rest of the original core of Moffett Field. The giant parabola of Hangar 1 towers 65 meters (211 feet) above the plaza. Constructed in 1932 through 1933, this one-story steel truss building is one of the largest non-internally supported buildings in the United States, enclosing 3 hectares (8 acres) of land. The smooth curve of its plate metal cladding is detailed on each side with bands of horizontally oriented windows set flush in the skin. Gigantic curving doors on tracks create the north and south ends of the buildings. Hangar 1 is historically significant because of its unique use, its beautifully executed Streamline Moderne design, its ingenious structural construction, and its size; it is still the dominant landmark in the southern San Francisco Bay Area. In addition to anchoring the Shenandoah Plaza Historic District, Hangar 1 has been designated a Naval Historical Landmark and a California Historic Civil Engineering Landmark by Section 57 of the American Society of Civil Engineering.

Hangar 1 was recently found to be a source of PCBs, as well as lead, asbestos, and zinc. Both NASA and the Navy undertook actions to address this contamination in 2003. As part of a subsequent action, which was completed by the Navy in June 2013, Hangar 1 has been stripped of its siding, man doors, roof, and windows, and the steel framing that remains has been covered in a special coating to provide a protective barrier over any remaining hazardous materials. For additional information on this subject, refer to Chapter 18, *Hazardous Materials*.

7.4.2.2 Ames Research Center Campus Historic Buildings

7.4.2.2.1 The Unitary Plan Wind Tunnel Complex

The Unitary Plan Wind Tunnel Complex (Building N-227) is the only building at ARC that is currently included on the NRHP. It was listed as a National Historic Landmark on the NRHP in 1985 because of its significant association with the development of the American space program. It has also been designated an International Historic Mechanical Engineering Landmark. The Unitary Plan Wind Tunnel Complex consists of three separate wind tunnels, each of which loops back to connect to the same central 193,880-megawatt (260,000-horsepower) engine. Covering 7,100 square meters (77,000 square feet), the three huge loops of metal conduit create one of the most striking architectural landmarks at ARC.

7.4.2.2.2 Other Elements

In 1995, ARC conducted a historical survey of 19 additional buildings that had been built in 1950 or earlier. Three of these buildings (N-200, N-221, and N-226) were determined to be eligible for inclusion on the NRHP. These buildings are associated with the advancement of aeronautics, science, and exploration during World War II and the post-war period (1940-1950). The findings of this survey were submitted in November 1995 to the California SHPO for review. The SHPO did not formally respond to the submittal, although ARC requested a formal response in December 1997. Historic buildings at ARC are listed in Table 7-3.



Table 7-3. Historic Buildings at the Ames Campus

Bldg. No.	Current Identification	Date Built
N-200	Administration Building- (nominated)	1943
N-221	12- by 24-meter (40- by 80-foot) Wind Tunnel- nominated	1944
N-226	2- by 2-meter (6- by 6-foot) Supersonic Wind Tunnel- nominated	1946
N-227	Unitary Plan Wind Tunnel	1954
Source: NASA 2009.		

The Administration Building (N-200) was constructed in 1943 and dates back to the earliest years of the ARC. Its importance relative to the other structures at the ARC is signified by the greater degree of ornamental detail near the windows and entry, as well as its formal, symmetrical facade. As the Administration Building, it housed ARC's management during its gradual transformation from an aeronautical laboratory emphasizing high-speed wind tunnel research to the diverse and sophisticated research campus of today.

The 12- by 24-meter (40- by 80-foot) Wind Tunnel (N-221) is the single most prominent landmark within the ARC campus area. This structure is the largest wind tunnel in the world. For almost 40 years, it was a closed-system tunnel. An expansion from 1979 to 1982 created an additional 24- by 37-meter (80- by 120-foot) test section with an open-intake air system. The wind tunnel was designed to test full-scale aircraft. It was used during the last year of World War II, and it served as the test site of the first U.S. aircraft with a jet engine, the Ryan XFR-1.

The 2- by 2-meter (6- by 6-foot) Supersonic Wind Tunnel (N-226) is the site of testing that led to significant advances in the fields of aerodynamics and space exploration by helping to solve the mysteries of flight beyond Mach 1. The supersonic wind tunnel included a feature that allowed a range of speeds from Mach 1.3 to 1.8, and 130-centimeter (50-inch) glass windows for researchers to observe the flow of supersonic air around the models in the tunnel.

7.4.2.3 Eastside/Airfield

In November 2013, NASA prepared a historic property survey report (HPSR) for the Airfield area of the ARC. The HPSR was prepared as part of ongoing consultation between NASA and the SHPO regarding the NHRP eligibility of the Airfield area of NASA ARC as a contributing feature of the NAS Sunnyvale Historic District. The HPSR provides NASA and its potential tenant(s) or lessees with baseline information on the physical features of the Airfield that should be treated in accordance with historic preservation standards. The HPSR includes a physical history of the Airfield and related features; a statement of significance and integrity evaluation; an inventory of contributing and character-defining features; and treatment recommendations for the Airfield. The HPSR supports NASA's compliance with Section 110 of the NHPA and with other laws and regulations related to cultural resources management (NASA 2014b).



7.4.3 Cold War Resources

In March 1999, an Inventory and Evaluation of Cold War Era Historical Resources of Moffett Federal Airfield and the NASA Crows Landing Flight Facility (formerly Naval Auxiliary Landing Field) was conducted. The survey concluded that, of the 148 buildings and structures evaluated, none were considered eligible for listing on the NRHP. Twenty of these buildings were used specifically to support the P-3 Orion anti-submarine warfare mission at Moffett Federal Airfield. Although the mission was considered of exceptional national significance within the Cold War context, the buildings themselves do not exhibit special architectural or engineering features that would give them exceptional significance as representatives of the Cold War P-3 mission. The remaining 128 buildings and structures are considered support buildings found at any installation and therefore are not considered significant (Cole 1999).

7.4.4 Space Shuttle Program Resources

Between August and October 2007, NASA conducted an assessment of eleven properties within ARC, including 10 buildings and a 36% Scale Orbiter Model (currently on display on the west side of the NFAC to determine their eligibility for listing in the NHRP in the context of the Space Shuttle Program. Of the properties surveyed, only N-238 (Arc Jet Laboratory) and N-243 (Flight and Guidance Simulation Laboratory) were determined to meet the general registration requirements for listing in the NHRP within the context of the Space Shuttle Program. N-238 was determined to be significant under Criterion A (Events) for the research and development of the Space Shuttle's thermal protection systems. N-243 was determined to be significant under Criterion A (Events) for the VMS, which contributed to the training of the astronauts for the Space Shuttle Program. Both properties retain historic integrity and were determined to qualify for NRHP Criteria Consideration G: Properties that have Achieved Significance within the Past 50 Years. The remaining nine buildings and 36% Scale Orbiter Model did not meet the general registration requirements and were determined to be ineligible for listing in the NHRP in the context of the Space Shuttle Program (Page and Turnbull 2007).

7.5 Environmental Requirements

NASA is committed to the preservation and rehabilitation of existing cultural resources on the ARC site when feasible and practicable. Therefore, NASA has identified the following plans, policies, guidelines, and measures that ensure proper management of cultural resources at ARC in compliance with applicable federal, state, and local laws.

7.5.1 NASA Procedural Directive 8500.1, NASA Environmental Management

Per NPD 8500.1, it is NASA policy to: maintain compliance with all applicable federal, state, and local environmental requirements; to incorporate environmental risk reduction and sustainable practices to the extent practicable throughout NASA's programs, projects, and activities; and to consider environmental factors throughout the life cycle of programs, projects, and activities (as defined in NPD 7120.4, *NASA Engineering and Program/Project Management Policy*, and related documents), including planning, development, execution,



and disposition activities. Examples of environmental factors include consideration of environmental impacts as required by the NEPA and NHPA; the proposed use of hazardous materials; the potential for waste generation; the need to acquire necessary permits, waivers, and authorizations; and the use of environmentally-preferable materials and processes wherever practicable.

7.5.2 Ames Procedural Requirements 8500.1, Ames Environmental Procedural Requirements

APR 8500.1 sets forth general procedural requirements to ensure compliance with applicable federal, state, and local environmental laws; regulations and EOs; and NASA policies and procedures. Organizational directors, division chiefs, branch chiefs, section heads, supervisors, managers, and CORs are responsible for planning, designing, constructing, managing, operating, and maintaining facilities in conformance with applicable regulatory directives, and should obtain environmental review from the Environmental Management Division early in project planning consistent with NASA's NEPA implementing procedures (NPR 8580.1 and EO 12114), NASA policies and procedures for programs and projects (NPR 7120), and NASA regulations related to environmental quality (14 CFR 1216). Program and project managers should coordinate with the Environmental Management Division in a timely manner to ensure that any new or modified programs, projects, and activities comply with regulatory requirements.

7.5.3 NASA Procedural Requirements 8510.1, NASA Cultural Resources Management

NPR 8510.1 implements applicable requirements for the Cultural Resources Management (CRM) Program under NPD 8500.1, NASA Environmental Management, described above. NASA's CRM Program is managed by the agency's Federal Preservation Officer, Environmental Management Division, and NASA Headquarters, and is implemented by the Center Historic Preservation Officer at NASA's 13 Centers and component facilities, including ARC. The agency-wide program provides the policy and procedures to ensure the preservation of cultural resources with significant ties to NASA's mission, communities, and the history of the Nation. It also assigns key roles and responsibilities for establishing, assigning, and maintaining CRM Program requirements.

7.5.4 Ames Environmental Work Instructions

Ames's EWIs, which replace the previous Ames Environmental Procedures and Guidelines (APR 8800.3), set forth requirements to ensure that programs, projects, and activities at ARC comply with applicable federal, state, and local laws; regulations and EOs; and NASA policies and procedures. Each EWI lists relevant regulatory authorities and documents, assigns individual and organizational responsibilities within ARC, and identifies specific requirements applicable to the work being performed.

The following EWIs are relevant to operations and future development at ARC with the potential to impact cultural resources.

- EWI 12, Public Involvement



- EWI 14, NEPA and Environmental Justice
- EWI 16, Cultural Resources Management (Under review)
- EWI 18, Environmental Requirements for Construction Projects (Under review)

7.5.5 NASA Ames Integrated Cultural Resources Management Plan

Per NPR 8510.1, an Integrated Cultural Resources Management Plan (ICRMP) has been prepared for ARC as an internal compliance and management tool that integrates the NASA Cultural Resources Management (CRM) Program with mission activities at ARC. The CRM Program is NASA's historic preservation program established for the identification, evaluation, and protection of historic properties in compliance with the NHPA and its implementing regulations (36 CFR Part 800). The CRM Program provides the policy and procedures to ensure that each NASA center and component facility complies with all of the local, state, and federal laws and regulations related to cultural resources management, including NHPA, NEPA, NAGPRA, and ARPA.

For details on relevant measures, please see the ICRMP, found at <http://historicproperties.arc.nasa.gov/icrmp.html>.

7.5.6 NASA Ames Historic Resource Protection Plan

NASA has prepared a Historic Resources Protection Plan (HRPP) that establishes criteria and guidelines for the ongoing preservation and maintenance of historic resources within the Shenandoah Plaza Historic District. NASA's HRPP sets out nine preservation management goals and policies for the Shenandoah Plaza Historic District. The HRPP also categorizes all properties within the district following a system of National Register Treatment Categories based on those developed by various branches of the DOD. NRHP eligibility has been determined for all Shenandoah Plaza buildings. Yet within this group, there is flexibility for determining treatment categories. Each of the four treatment categories proposes a particular level of preservation treatment suitable for the significance of the resources within it. The HRPP states that all undertakings that may affect the Shenandoah Plaza Historic District shall implement treatments as outlined in the plan.

Any future projects that involve the rehabilitation of contributing buildings within the Shenandoah Plaza Historic District would also follow the HRPP. Appropriate landscaping would be used to avoid impacts to historic buildings. The HRPP includes the guidelines for the rehabilitation of historic structures located at ARC. New additions would be located on secondary facades. Restoring facades that have been previously altered would be considered as an alternative.

The HRPP is included in Appendix G of the NADP EIS.

7.5.7 NASA Ames Historic Re-Use Guidelines

NASA has prepared design guidelines to assist NASA Ames professional staff, tenants, and their consultants in rehabilitating historic structures within Shenandoah Plaza. The



guidelines are intended to be a design aid in determining acceptable alterations, additions, and repairs for preserving the character of existing buildings. They are based upon *The Secretary of the Interior's Standards for Rehabilitation*.

The guidelines set parameters for compatible designs including orientation, height, setback, materials, and style. The guidelines also indicate which areas must not be used as building sites. Any project undertaken within the vicinity of designated or potentially designated resources, structures, or districts would be subject to review by the SHPO through the Section 106 process. Any agreed-upon mitigation, such as plan modification and design harmony, would be undertaken.

7.5.8 NASA Ames Development Plan Final Programmatic Environmental Impact Statement

The NADP EIS identifies the following mitigation measures to address potential impacts to cultural resources from build out of NADP Mitigated Alternative 5.

7.5.8.1 Mitigation Measure CUL-1

In the event that human remains and/or cultural materials are found, all construction would cease within a 15-meter (50-foot) radius in order to proceed with the testing and mitigation measures required pursuant to Section 7050.5 of the Health and Safety Code and Section 5097.94 of the Public Resources Code of the State of California. The SHPO and the NASA Federal Preservation Officer would be contacted as soon as possible. Construction in the affected area would not resume until the regulations of the Advisory Council on Historic Preservation (36 CFR Part 800) have been satisfied.

7.5.8.2 Mitigation Measure CUL-2

In the event of the discovery of human remains, the project manager would notify the Santa Clara County Coroner. The coroner would make the determination as to whether the remains are Native American. If the coroner determines that the remains are not subject to his or her authority, s/he would notify the Native American Heritage Commission, who would attempt to identify the descendants of the deceased Native American. If no satisfactory agreement can be reached as to the disposition of the remains pursuant to state law, then the remains would be reinterred with items associated with the Native American burial on the property in a location not subject to further disturbance.